

AMENDMENT UNDER 37 C.F.R. § 1.116  
Application No.: 10/042,154  
Atty Docket No.: Q62628

**REMARKS**

The Office Action of May 11, 2004 has been received and its contents carefully considered.

Claims 1 to 21 are all the claims pending in the application, prior to the present amendment.

The Examiner states that a complete reply to the final rejection should include the cancellation of non-elected claims 13 to 20.

In response, applicants have canceled claims 13 to 20.

The Examiner sets forth a number of observations/interpretations relating to the claims, and states that these observations/interpretations relate to the rejections that he sets forth in the present Office Action. The Examiner's observations/interpretations generally are the same as those in the previous Office Action, except that he now additionally states that the sol product is derived from an alumina salt and a base or chelating agent.

Applicants do not consider that the Examiner's interpretations are correct.

First, the claims refer to an "aluminum" salt, not an alumina salt.

Further, it seems that the Examiner interprets the sol product can be produced as one that by merely mixing the compounds set forth in (i) or (ii) of claim 1. This is not correct. As described in [0031], [0032], [0053], etc. of the present specification, the sol product can only be obtained by mixing the compounds by a high-shear stirring.

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Since claim 1 sets forth that the sol product is produced and that the sol product is amorphous, the sol product that is recited in claim 1 is clearly distinguished from a mere mixture of the compounds. In order to even more clearly distinguish the amorphous sol product from a mere mixture, applicants have amended claim 1 and various dependent claims to state the sol product “is obtained by high-shear stirring of a” mixture of the recited components.

In addition, the Examiner states that the claims are open to further ingredients, including boehmite, which according to the Examiner is a crystalline form of alumina that is commonly referred to as a sol or a slurry. Applicants point out, however, that the present claims require the presence of an amorphous sol product. Accordingly, even if a boehmite sol is present, this would not satisfy the requirement of the present claims for an amorphous sol product.

Claims 1, 7, 10-12 and 21 have been rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over WO 99/35089 to Nissan Chemical Industries, Ltd. (Nissan), as evidenced by U.S. Patent 6,080,216 to Erikson.

In addition, in Paragraphs 11 to 19 of the Office Action, in a section entitled “Response to Arguments”, the Examiner sets forth various comments in response to the arguments that applicants previously submitted.

Applicants submit that Nissan does not disclose or render obvious the presently claimed invention and, accordingly, request withdrawal of this rejection.

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Nissan does not disclose or suggest an amorphous sol product as recited in the present claims, and does not disclose or suggest the process conditions that would result in the formation of an amorphous sol product.

In general, the Examiner's detailed statement of the Office Action is essentially the same as his statement in the previous Office Action, except that the Examiner now asserts that the basic aluminum nitrate in Nissan would have been expected to have limited solubility and result in the formation of amorphous sol particles for at least a portion of the basic aluminum nitrate.

In response, applicants submit that it is not correct if the Examiner interprets that an aqueous alumina slurry of Nissan (Example 1, page 16, second paragraph) is produced from basic aluminum nitrate. The aqueous alumina slurry in Nissan is not produced from basic aluminum, but is prepared separately. In addition, Example 1 of Nissan states that the basic aluminum nitrate is a solution and does not describe that the solution is a sol.

The Examiner indicates that the basic aluminum nitrate in Nissan would have been expected to have limited solubility and result in the formation of sol particles. This is not always the case. Basic aluminum nitrates have different natures depending on the number of their basic components and form sol particles in a solution depending on their hydroxyl ratio. It cannot be said that all basic aluminum nitrates form sol particles in a solution and that the basic aluminum nitrate in Nissan form sol particles.

Furthermore, sol particles obtained merely from an aqueous solution having a solubility higher than that of basic aluminum nitrate do not bring about the sol product of the present

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invention insofar as high-shear stirring is not conducted. Moreover, there is no description in either Nissan or Erikson concerning the formation or use of an amorphous sol product.

In Paragraph 14, the Examiner states that applicants have added a claim 21 which sets forth the particle size of the alumina crystal as 0.2 to 5 microns. The Examiner states that this micron particle size would be characterized as a slurry.

In response, it cannot always be said that a slurry is necessarily present from the mere fact that particles of alumina crystals are minute. A slurry denotes a suspended state in a medium, such as water. A “microparticle state” and “suspended state” are not always the same.

In Paragraph 15, the Examiner states that applicants have argued that the basic aluminum salt can not form an amorphous sol, and that alkalis are indispensable for the forming of an amorphous sol.

The Examiner states that while applicants’ assertion may be true for acid salts, Nissan and Erikson employ basic aluminum nitrate, not the acid salt, that is, aluminum nitrate. The Examiner states that the alkali has already been added to the basic salt.

In response, applicants point out that the paragraph bridging pages 8 and 9 of Nissan states that even in a reaction mixture having a pH exceeding 12, the aqueous alumina suspension has a boehmite structure, which is not an amorphous structure. Addition of excess alkali does not result in obtaining a sol product that is amorphous.

If one ignores the production method, it is possible that under certain circumstances, a basic aluminum nitrate may be formed into aluminum nitrate with alkali already added. Since

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there is a difference between Nissan disclosing a crystal structure and the present invention disclosing an amorphous structure, the production method cannot be ignored.

In Paragraph 17, the Examiner states that applicants have argued at page 12 of the previous Amendment that Nissan does not use an alumina sol in the final polishing slurry. The Examiner states that Nissan clearly teaches (a) water and (b) alumina crystals within the size of 0.2 to 5 microns. The Examiner states that Nissan discloses the further addition of basic aluminum nitrate, which is taught in Erikson to form sols by adding basic salt to water, that is, the claimed component (c).

In response, even if the Examiner's contention is correct that Erickson forms sols by adding a basic salt to water, the sol taught by Erikson is a sol having a crystal structure because  $\alpha$ -alumina or boehmite is used as the raw material. On the other hand, the sol product of the present invention is an amorphous sol having no crystal structure and is not taught by Erikson or Nissan.

In Paragraph 18, the Examiner states that applicants, at pages 12 and 13 of the previous Amendment, set forth arguments relating to claims 10 to 12. The Examiner responds to these arguments by stating that Nissan discloses concentrations and basic aluminum nitrate well within the concentrations in claims 10 to 12. The Examiner states that at least the minimum sol concentration of 0.01 mass % (100 ppm) would have been expected when employing basic aluminum nitrate at concentrations of 0.1 to 10% by weight, preferably 0.3 to 6 % by weight.

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In response, as discussed in detail above, it is not correct to regard the basic aluminum nitrate of Nissan and the sol product of the present invention as being the same.

In Paragraph 19, the Examiner states that applicants have argued, at pages 14 and 15 of the previous Amendment, that Nissan does not teach the sol in the final polishing composition. The Examiner asserts that this is not persuasive because the Nissan reference teaches the addition of the salt as polishing accelerators. The Examiner states that these salts would have formed the sols of component (c).

In response, as discussed in detail above, it is not correct to regard the basic aluminum nitrate and the sol product of the present invention as being the same.

In view of the above, applicants submit that the present claims are patentable over Nissan and Erickson and, accordingly, request withdrawal of this rejection.

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Claims 1 to 7, 10 to 12 and 21 have been rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Yamada et al.

Applicants submit that Yamada et al do not disclose or suggest the presently claimed invention and, accordingly, request withdrawal of this rejection.

The Examiner argues that Yamada et al disclose polishing compositions comprising alumina dispersed in water and in combination with aluminum salts and chelating agent such as aminocarboxylic acid salts and polishing accelerators, and that these components would form a sol. Such a disclosure appears in Example 2 of Yamada et al. See, for example Run Nos. 2-5.

Yamada et al disclose in Example 2 that their composition contains  $\delta$ -alumina, an aluminum salt and a chelate compound such as an aminocarboxylic acid-based chelate compound.

Applicants submit, however, that it is a hasty conclusion to consider that mixing an aminocarboxylic acid-based chelate compound and an aluminum salt can produce the sol product of the present invention. Mixing the two merely results in a mixed solution thereof, and does not always produce a sol.

In order to obtain a sol, the two have to be mixed by means of a high-shear stirrer. See, for example, paragraphs [0031, [0032], [0053], and the like, of the present application. Example 2 in Yamada et al does not describe either the high-shear stirring or the sol production. Therefore, it cannot be said that Example 2 of Yamada et al discloses or suggests the polishing composition of the present invention.

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In response to applicant's arguments, the Examiner asserts that Yamada, et al employ a high-shear mixing in Example 2.

Applicants point out that, Yamada et al certainly use a "high-speed" stirrer, as disclosed at column 5, line 36. However, Yamada, et al do not show that the high-speed stirrer mixer is a high-shear stirrer. Accordingly, the Examiner's argument is not correct.

In view of the above, applicants submit that Yamada et al do not disclose or suggest the subject matter of claims 1 to 7 and 10 to 12 and, accordingly, request withdrawal of this rejection.



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Claims 8 and 9 have been rejected under 35 U.S.C. § 103(a) as obvious over Nissan as evidenced by Erikson and further in view of Peterson.

Claims 8 and 9 depend from claim 1 and, accordingly, applicants submit they are patentable over Nissan for the same reasons as discussed above in connection with the rejection of claim 1 over Nissan.

Claims 8 and 9 recite that the sol product is obtained by a high-shear stirring of a mixture of at least one aluminum salt selected from the group consisting of aluminum sulfate, aluminum chloride and aluminum nitrate with at least one compound selected from group consisting of sodium hydroxide, potassium hydroxide, ammonia, triethanolamine and aminotrismethylenephosphonic acid.

Peterson disclosed various dispersion aids, including basic aluminum salts such as basic aluminum chloride and basic aluminum nitrate, but Peterson does not disclose that these salts should be used in combination with at least one compound selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonia, triethanol-amine and aminotrismethylenephosphonic acid to form an alumina sol.

In addition, the alumina sols that are disclosed in Peterson are boehmite sols that are used to form dried, solid alumina particles (crystals), and are not used to form polishing compositions.

Further, the dispersion aids in Peterson are used in a process to make alumina particle based dispersions which are then processed into dried solid abrasive alumina particles (crystals). Peterson does not disclose the use of the dispersion aids or the boehmite sols to form polishing

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compositions containing the components (a), (b) and (c). Applicants also point out that the effects peculiar to claims 8 and 9 are to accelerate the polishing speed, greatly reduce the amount of roll-off and obtain a high-quality mirror-finished surface free of pits, projections and scratches. See paragraphs [0028], [0057] and [0058] of the present application.

In view of the above, applicants submit that Nissan, Erickson and Peterson do not disclose or suggest the subject matter of claims 8 or 9 and, accordingly, request withdrawal of this rejection.

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Claims 8 and 9 have been rejected under 35 U.S.C. § 103(a) as obvious over Yamada et al and further in view of Peterson.

The Examiner also refers to Nissan in his rejection, but it appears to applicants that this is a mistake and the Examiner intended to refer to Yamada et al.

Claims 8 and 9 depend from Claim 1. Accordingly, applicants submit that claims 8 and 9 are patentable over Yamada et al for the same reasons as discussed above in connection with the rejection of claim 1 over Yamada et al.

In addition, applicants rely on the arguments they set forth above with respect to Peterson.

Applicants have also argued that one would not have had any reason to combine Peterson with Yamada et al. The Examiner states they are combinable because they are an alagous oil and Peterson shows materials for improving the dispersion properties of dispersions in.

In response, applicants maintain that Yamada et al disclose a polishing agent to obtain a precise surface, such as that of a hard disc, whereas Peterson discloses a coated abrasive exhibiting an enhanced grinding performance capable of cutting several tens of grams of a steel workpiece per minute; that the application of the coated abrasive in Peterson to the hard disc in Yamada et al would result in grinding the disc into nullification; and that the application of the polishing composition of Yamada et al to the steel workpiece in Peterson would result in substantial failure to grind the steel workpiece. Accordingly, applicants maintain that there is no motivation for those skilled in the art to combine Yamada et al and Peterson.

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Furthermore, the alumina sol in Peterson is not an amorphous sol, and there is no description in Peterson in respect of the production of a sol in consequence of the preparation of the dispersant.

In Paragraph 27, the Examiner asserts that the combination of the aluminum salt and the chelating agent in concentrations as polishing accelerators and/or dispersion aids would have been expected to form at least some amorphous sol product. The Examiner states that the materials in the prior art are made by the same process as the process that is employed to make applicants' claimed sol products.

In response, the materials that are disclosed in all of the above references is crystal alumina, from which a sol product can be manufactured. As stated above, none of the references teaches the amorphous sol product of the present invention.

In view of the above, applicants submit that claims 8 and 9 are patentable over Yamada et al and Peterson and, accordingly, request withdrawal of this rejection.

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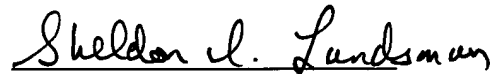
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In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Sheldon I. Landsman  
Registration No. 25,430

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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